

TOP SECRET

SUGGESTED AGENT TRAINING - VHF COMMUNICATIONS BGFIEND/QKSTAIR

1. It is felt in many quarters that the complexities of air-ground communications are not sufficiently appreciated by some operational groups. This results, as we all know, in local, last minute problems that generally subtract from the overall effectiveness of this technique. By way of background, some of the considerations might be in the following order. Here are included the factors of sufficient flight crews; aircraft communication requirements versus the available hours of flight time to service a given number of teams, some using cipher and some clear text; sufficient airborne radio operators to support the routine flights and to back up special flights per requests of teams already "in". Operators must be trained beyond the stage of merely parroting instructions. A good air operator can recognize the difference between ground flutter, shutter fade-outs, extreme range signals etc. He then must instruct the pilot the proper corrective course to follow to maintain contact. This is particularly true where the installations used are not the rotatable beam type of the war, but are merely omni-directional.

2. Ground teams as we know must carry various items of equipment and they must be mobile. Invariably, the last thought is how much communication equipment is needed and how much less can be done without. This usually means a sacrifice of batteries, which in turn requires a supply drop ahead of schedule, thereby upsetting already planned operational activities. This is a circle that continues into all phases of an air-ground show. This condition would not be necessary if Commo was allowed full details in planning this type of operation, as it is impossible to separate the daily movements of agents from their communication responsibilities. This seems to be a characteristic of VHF.

3. Terrains bear a great importance in the operational problem as a whole that are not seen immediately. Where aircraft are limited to altitudes below 12,000 feet because of the lack of high altitude equipment on engines, etc., and in this general area mountain ranges are to be found around the ground stations, many times reaching 8,000 feet or a large percentage of the highest of the transmitter antennas, this puts more than a simple burden of judgment on the ground operator when it comes to climbing to great heights, in some seasons thereby encountering deep snows, even before he approaches a line of sight. The answer obviously to this is higher flying. The profiles for some planned operation areas require flights of 30,000 feet. Existing aircraft on this project cannot meet this requirement.

4. If flights of this altitude are impossible and agent movements are generally unlimited, then the entire country must be, and was, zoned into areas where line of sight and antennas to 12,000 feet could be obtained. This was predicated on the assumption that the ground set

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has to be within approximately 200 meters from the highest prominence in these map zones. This process proved the requirement of accurate maps for operations of this type. Local maps used were HTStein, KMulcer, and LCFlake; and, as a point of interest, in many details of locations and heights these three maps disagreed sometimes to as much as 4,000 feet. Where possible the HTStein maps were used. In mountain elevations, contour lines are absolutely essential, but maps of this area were found to be deficient in this detail. This need of limited ground locations would not be so great if the aircraft could follow the war-time procedure of going within a few miles and overhead of the ground transmitter. In this area, however, the plan is standing off anywhere from 40 to 50 miles from the target area and with a mountain range in-between.

5. Sufficient data must be on hand in advance of a "drop" operation as to the maximum rate of descent the communications equipment can stand, so that proper chute loadings may be made. If the chute falls too slowly, there is danger of drifting out of the drop zone, making its location difficult if not impossible.

6. The type of infiltration planned should be known to the Communications Division in advance so that proper containers can be supplied. Rubber expendable sacks for sea infiltration, drop containers suited to the equipment, carrying packs for "walking in", etc. should be supplied.

7. The simplicity of the typical VHF hand transmitter has given a great many people an over-simplified concept of what it takes to establish a reliable point-to-point circuit. The problem outlined in the above paragraphs can be better met when personnel to be used as agents with this type of medium have a fundamental conception of the simple mechanics involved.

a. The problem of training time is always put forth in the earlier discussions by the field operational people and the course varies with the exact type of agent or agents involved. Experience at this station has shown on an average that with 60 hours of actual training the people were able to handle their general communications problems with apparent confidence. They showed this confidence 1 or 2 hours after original instruction; however, by deliberately letting up for 2 days of instructions and running a sudden night problem, they would not handle themselves in such a task as to make a contact. Their original eagerness, of course, responsible for their apparent confidence, which is a false confidence. We found it advantageous to give chalk talks in showing the method of line of sight communications and what it means, such as drawing profiles, drawing rays bouncing off mountains, and drawing a man on the other side of a mountain simulating the receiving point. This could be backed up with a flashlight type mirror demonstration of reflections.

b. A signal strength

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b. A signal strength meter was set up on one side of the room with the VHF set on the other side and the shadow effect of people standing in line with the transmitter thereby breaking the signal strength meter can be and was demonstrated. This brought to their mind to a greater degree than any other system this problem of line of sight communications. All of their past practical experience with radios has been listening to sets indoors either with or without antennas without any regard to line of sight. The motorolas being radios, they expected to follow the same system as on the other radio. We stated merely that these were special types and that waves could not go through walls, mountains, etc. but must go through clear space.

c. Therefore, considerable time was spent in lecturing and actual mountain trips demonstrating good and bad locations. Actual training flights were made where the agent was allowed to pick his own cite. On occasion there would be no contact as the location picked was improper. We would then move him a few hundred yards to a proper location and he would be greatly impressed and on all future problems showed a greater skill in picking the location. The "signal mountain" type of thinking was thereby implanted.

d. So long as VHF agents are to be asked to roam relatively large areas of a given country from these many different locations, map reading assumes much greater importance than mere navigation. The problem outlined in paragraph 4 proved to be very important and placed considerable burden on the ability of the individual radio operator. He further was required to know the meaning and properly read contour lines of his map so as to get high enough on the side of the involved mountain to establish contact. Therefore, I would suggest that at least 5 to 10 hours of contour map reading be established as a minimum time with, of course, the length of time depending actually on the slowness of the man.

e. In actually handling the equipment while they very early after one or two lectures and demonstrations showed an ability to change batteries, this too was apparently forgotten, and at the end of a week or so then it was necessary to reinstruct this simple operation. Therefore during all training exercises I feel the trainee should be made responsible for his equipment, its particular condition, and its general handling.

f. While on the subject of batteries a simple device should be made and used in training, consisting merely of a coax fitting and a 60 MA lamp. This is used to check the output of the motorola on the transmitter position and will glow with

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approximately one-half normal brilliance when all is well. By frequent use of this test lamp they will be able to keep a contact-to-contact idea of the condition of the batteries and will not keep changing them prematurely, thereby expending the very limited supply.

g. With regard to cryptographic training, approximately 40 hours of encipher-decipher was given to the last group of teams to be processed in this area. Subsequent contact with them proved that in this case the training was sufficient as all messages received were free from garbles and their use of procedure and call signs within the cipher text proved that training again was sufficient to allow them the complete use of a cipher system.

h. After field trips to demonstrate locations and after 25 or 30 hours of cipher instruction, room-to-room circuits in the training house were established whereby the various operators were required to handle dummy traffic complete with headings, call signs, in otherwords, the entire Omegat procedure. This continued for approximately 3 or 4 days. As a final check on their proficiency, night training operations were conducted in new mountain areas wherein the operators choose their own site, made contact with the aircraft (they were never told an aircraft was the other end of the contact) and handled dummy traffic. Each training contact was based on random days, that is, they were given slips of paper telling them to assume that they were operating on the 1st, 7th or 8th days etc. of any given month and had to figure their call sign, etc. and the training contact.

i. Another problem that should be dealt with is training in dictation writing, either numerical or literal cipher text. I feel that this is one of those important problems that does not appear on the surface but has a great bearing on the length of time that the communications aircraft must stay in an area. On one contact it was necessary for the plane to spend approximately one-half hour in handling a short message that, if the man could have written or had had more practice, could have been handled in 10-15 minutes. As it was, he needed many repeats before completing the message.

j. While in lecture classes an awareness of the fragility of the equipment was emphasized on many occasions and their acceptance of this, let the instructors to believe that they realized that the sets should be handled with due care. However, field trips at night showed a distressing ability on the part of the teams to hit every boulder with the sides of the sets. The only cure found for this was to observe them on field trips and to constantly call attention when the sets had not been properly handled. The men should be instructed in the proper way to set

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the webbing supplied with the motorolas so as to carry them high on the shoulder and free from accidental bumping and knocks. This is particularly true after a team has established itself and is no longer burdened with all of the equipment that they initially carried or dropped in with. As the communications man of a given team will probably climb to his contact point with his set and other equipment every few days, the proper carrying becomes important. The simple procedure of wiping off the insulator during fog mists had to be taught at this station. This resulted in a very poor contact, and it was demonstrated that after wiping the base insulators, the contact became normal; again the men were impressed. But this should all be covered in the general training and briefing and not in a last minute review.

k. Lastly, the telling of time and all of its importance should be treated. We found some proposed agents that could not realize that a day had two dark periods and our entire plan was changed. Others can handle a 2400 hour day with ease.

l. While to the experienced commo man many of these points seem self-evident and too basic, experience with teams that have passed through this station shows them to be very much in evidence and, I feel, bear quite a great deal on the success of these operations.

m. Due to a recent compromise by capture, the call sign method as outlined in Omegaet is being changed at ZRMetal direction. However, the procedure and method of handling traffic is the same. The cipher context has been enlarged to actually encipher names, locations and other sensitive data into a numerical or alphabetical system. Therefore, the use of the O.T.P. should be taught.

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